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STRUCTURAL CHANGES IN THE IRON AND STEEL INDUSTRY DURING THE 1980s WITH PARTICULAR REFERENCE TO DEVELOPING COUNTRIES

Study prepared by the UNCTAD secretariat

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Foreword

In November 1989, the UNCTAD Committee on Manufactures decided (paragraph 7 (a) of resolution 14 (XII)) to consider in its future work:

> "Trends and features in the demand for, and supply of manufactures and semi-manufactures, including changing patterns of comparative advantage, market access and export supply aspects in specific sectors of current and potential export interest to developing countries, taking into account work being carried out elsewhere in UNCTAD and the United Nations system".

This study forms part of the secretariat work programme in response to the Committee's request to the Secretary-General of UNCTAD "to prepare documentation as appropriate, to enable the Committee to consider these issues at its next session".

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Abbreviations

BOF	basic oxygen furnace
BPS	basic price system (EEC)
CC	continuous casting
DMEC	developed market-economy country
ECSC	European Coal and Steel Community
ECU	European currency unit
EEC	European Economic Community
EFTA	European Free Trade Association
GSP	generalized system of preferences
NIC	newly industrializing country
OECD	Organisation for Economic Co-operation and Development
TPM	trigger price mechanism (USA)
VER	voluntary export restraint

I. MAJOR SHIFTS IN PRODUCTION AND TRADE

1. The iron and steel industry underwent a long period of crisis under substantial pressure for structural adjustment during the 1970s and 1980s. Despite the virtual stagnation of world consumption and production, major shifts occurred in the trading positions and production shares of major groups of countries, and certain individual countries. While the longer term trend in world exports and production pointed significantly downwards for the developed countries, production and exports of developing countries and China rose significantly in absolute and relative terms.

2. This long-term downward trend of developed market-economy countries' shares in world production and consumption in the last couple of decades has been subject to important short-term cyclical fluctuations. The fluctuations can be attributed to the fact that demand for steel is a derived demand which depends upon demand for those products which are large users of steel, e.g. ships, railways, bridges, machinery, engineering goods, construction materials, automobiles, etc. Demand for these investment goods fluctuates widely over the business cycle as does demand for steel between boom periods and slumps. The cyclical nature of the steel industry is closely reflected in the cyclical nature of production in DMECs (table 1).

3. However, these short-term fluctuations should not obscure the long downward trend line which has characterized the demand and production of steel in DMECs. The share of DMECs in total world production of crude steel had dropped from 66.4 per cent in 1970 to 56.2 per cent in 1980, then 48.6 per cent in 1988 (table 2). During the same period, the share of developing countries in total world production of crude steel rose from 4.3 per cent in 1970 to 14 per cent in 1988. The share of China also increased remarkably over this period.

4. The production decline in DMECs is not only manifested in relative shares. In absolute terms, even in a good year such as 1988 the production of crude steel in DMECs (377.8 million tons) was still below production in 1970 (393.7 million tons) (table 1). Between 1970 to 1988, world production of crude steel increased by 189.1 million tons while that of DMECs decreased by 15.9 million tons (table 4). The increase in world production over the past two decades has been mainly owing to higher production in developing countries, which contributed 45 per cent of the total increment of world production, along with China and the countries of Eastern Europe. The pace of production decline in DMECs was most pronounced during the first half of 1980 but subsequently production had recuperated to some extent, mainly for cyclical reasons.

5. Apparent consumption of crude steel shows a similar downward trend (table 3). Indeed, with the exception of 1988, which marks a sharp rise in apparent consumption in DMECs, apparent consumption in this group of countries has been declining since 1979. Between 1980 and 1987 apparent crude consumption in DMECs declined by 31.6 million tons while that of the world rose by 61.4 million tons. Most of this increase (45 million tons) was due to higher consumption in the countries of Eastern Europe while the remainder (16.4 million tons) was absorbed by developing countries.

6. The data in tables 1-4 reflect:

(a) A secular decline in demand for steel in DMECs, manifested in a long-term downward trend in their production and consumption; and

(b) A shift in comparative advantage in favour of developing countries.

7. A number of factors have contributed to a secular decline in demand in DMECs:

(a) Industrial maturity in DMECs implies the attainment of peak levels of steel consumption. Beyond a certain income level, the share of steel in total consumption tends to decline. In DMECs, the service sector's share in GDP tends to increase at the expense of manufacturing industries. However, services and notably information technology industries are far less steel-intensive than the manufacturing sector. An important consequence of declining steel intensity in DMECs is that one important aspect of comparative advantage in steel production, consisting of a dynamic domestic demand, is shifting away from DMECs and in favour of NICs.

(b) A decline of demand or growth in traditional steel-using industries such as automobile and shipbuilding industries.

(c) Technological advance has led to (i) the development of substitutes for steel such as plastic and aluminium which have partially replaced steel in vehicle production construction and other applications and (ii) a more efficient use of steel in production as well as the development of stronger, lighter speciality steel.

II. SHIFTS IN COMPARATIVE ADVANTAGES

8. A major indicator for changing comparative advantage is that the decline in demand in DMECs has been accompanied by a significant shift of market positions in favour of developing countries. Table 5 shows that developing countries had increased their share in world exports from 3.4 per cent to 11.2 per cent over the period 1975 to 1987, while that of DMECs had declined from 87 per cent to 79 per cent. Although the share of developing countries in total world exports is still quite marginal compared with that of DMECs, their rapid progress cannot be ignored. However, among developing countries, only a few have made an impact on export markets. In fact, two countries, Brazil and the Republic of Korea were dominant exporters among developing countries, accounting for 2.6 per cent and 2.9 per cent, respectively of world exports in 1987. Their combined shares accounted for nearly 50 per cent of developing countries' exports. Other exporters from developing countries are Taiwan Province of China, Mexico and Turkey, which together accounted for 2.0 per cent of world exports in 1987. There are also several smaller exporters such as Argentina, Venezuela, Indonesia, Malaysia, Zimbabwe, India, Saudi Arabia, Qatar, Algeria, Thailand, Singapore, Philippines and Yugoslavia.

9. Another indication of shifting comparative advantage in favour of developing countries is reflected in their growing import shares and market penetration in DMECs. Of the total imports by DMECs, in 1987 some 10.2 per cent was from developing countries compared with 5.7 per cent in 1980. The Republic of Korea and Brazil were the dominant exporters to DMECs in 1987, followed by Taiwan Province of China, Mexico and Turkey (table 7). The share of developing countries in major markets, as measured by the import penetration ratio, remains marginal, ranging for example from 0.5 per cent in the United Kingdom to 3.5 per cent in the United States in 1987 (table 8).

10. Another indication for rising developing-country capacity in this industry is the increasing degree of processing and sophistication of steel exports from these countries over time. In 1980, more than 40 per cent of their exports to DMECs consisted of pig iron, spiegeleisen and similar raw materials (SITC - 671) required for production of steel products in terms of import data reported by developed partner countries. However, by 1987 only about 19 per cent of developing countries' exports to DMECs consisted of such raw materials. Other major changes in the composition of developing countries' exports to DMECs include: an increase in the share of ingots and semis (SITC - 672); long products (SITC - 673) are mainly used for production of consumer durables such as car bodies. These three groups of products accounted for 63 per cent of the exports of developing countries to DMECs in 1987 as compared with 38 per cent in 1980.

11. Another major component of developing countries' exports is that of tubes and pipes (SITC - 678) which accounted for 15.9 per cent of their exports to DMECs in 1987. However, the contribution of developing countries' exports of more specialized steel, high carbon, alloy or coated steel products is still limited (see tables 6 and 7).

12. The degree of processing and sophistication of steel exports varies widely among developing countries. The Republic of Korea has a much larger share of flat and other sophisticated processed products than other developing country steel exporters, such as Brazil, Mexico and Taiwan Province of China. In particular, more than half of Brazilian exports consist of raw materials

and semi-finished products, though their market composition is also rapidly changing towards higher degrees of processing. This different composition of export production is to some extent shaped by the availability of rich iron ore deposits in Brazil, whereas raw materials are totally lacking in the Republic of Korea.

13. Various studies indicate that a main source of comparative advantage of developing countries lies in their cheap labour cost. For instance, a study by Paine Webber in "World Steel Dynamics" (Graph 1a) 1/ shows that the Republic of Korea, Brazil and Taiwan Province of China were the lowest cost producers, whereas Japan and the United States alternate, depending on exchange rate fluctuations, as the highest cost producer.

14. Extremely cheap labour cost distinguishes Brazil and the Republic of Korea from DMEC producers, despite the lower labour productivity of the former countries (Graph 1b). Material costs are very similar for all producers, the only exception being Brazil which enjoys cheap domestic materials. However, financial costs are significantly higher in Brazil, the Republic of Korea and Taiwan Province of China than in most developed countries, owing to heavy depreciation costs for new installations as well as high interest rates. They partly compensate for the advantages in operating costs in developing countries. None the less, the resulting overall pretax cost of commercial steel production in these countries is still significantly below that of most developed countries, apart from the United Kingdom. Towards the end of 1988, the (pretax) unit cost in France, Canada, Germany, United States of America and Japan was about 10 per cent to 30 per cent higher than the average level of the three developing countries mentioned.

15. Other factors which have contributed to a comparative advantage for producers in developing countries:

(a) A relatively high level of standardization of steel technology, and the fact that it is universally available from alternative sources on commercial terms; this renders access by developing countries to that industry relatively easier than in high-technology industries.

(b) The relatively recent vintage of their plants, as compared with established producers in DMECs, which has enabled the incorporation of new technological changes in the industry.

(c) Less stringent environmental standards and cost as compared with conditions in DMECs.

(d) Growing domestic demand for steel products in contrast to declining demand in DMECs; the domestic market has been a very influential factor in the development of the steel industry worldwide.

(e) Economies of scale owing to large-scale production in a few producer countries, such as Brazil and the Republic of Korea, and the emergence of steel enterprises of world market scale in those countries. 2/

III. STRUCTURAL ADJUSTMENT AND PROTECTION IN DMECs

16. The response to declining demand and competitive decline in DMECs has been a mixture of protectionism and structural adjustment. The pace and the timing of decline differ among DMECs as do the means and measures employed to restructure the industry. Competitive decline started much earlier in the United States (in the late 1950s) than in the European Economic Community (1970s) and Japan (early 1980s). Furthermore, the role of the State in response to the crisis in the steel industry has been far more prominent in the EEC than in the United States and Japan.

A. Protectionism and structural adjustment in the steel industry in the United States of America (USA)

17. In 1968 steel producers pursued simultaneously legislative and trade statutory avenues in the search for protection against rising import penetration. This same pattern was repeated in 1977 and 1984. 3/ The first approach took the form of lobbying by the steel industry in the United States Congress for quantitative restrictions on steel imports. The second approach involved a complaint filed by the American steel corporations with the United States Treasury Department against several European countries, alleging subsidization of steel exports. It called for the imposition of countervailing duties. However, the United States trade officials were concerned about the consequences of traditional protectionist policies, including direct import quotas, as these would violate the international trade liberalization commitment negotiated during the Kennedy Round. In the end, a politically expedient alternative to traditional trade policy instruments was chosen. In 1968, the United States Government concluded voluntary export restraint agreements (VER) with European and Japanese producers for 1969-1974. The VER approach represented a compromise which could satisfy domestic producers without, on the surface, violating international trade commitments or alienating trading partners. Steel exports by these countries to the United States were limited to 14 million tons in 1969, but were allowed gradually to increase in subsequent years.

18. The importance of those first VERs does not rest so much in their impact on trade and welfare, since the favourable market conditions of 1973-1974 made VERs in those years superfluous. Nevertheless, the introduction of VERs as an instrument of trade policy had a wide range of implications for future patterns of trade in the industry:

(a) The first VERs set a precedent in trade-policy thinking, learning and practice. The first VER agreements were rough, loosely defined and non-binding. They were subsequently further refined, with much more stringent and comprehensive control of steel trade when pressure for protectionism grew strongly in the second half of the 1970s and notably in the 1980s.

(b) Over time protection has been extended to a progressively wider range of countries including newly industrialized countries, such as Brazil and the Republic of Korea. Furthermore, protectionist policies have been considerably intensified since 1984. In the case of the United States, VERs are now binding and strictly controlled by the Government.

(c) The first VERs and the subsequent extension and intensification of protectionist policies postponed and slowed down the process of structural adjustment in the American steel industry. Protectionist policies thus contributed to the continued competitive decline of the American steel industry.

(d) The introduction of VERs in the United States in 1968 paved the way for the imposition of protectionist policies in the European Economic Community (EEC). The United States and EEC trade policies have been following a pattern of protectionism ever since 1968. 4/

19. At least four important factors have worked together to cause the competitive decline of the American steel industry since the 1960s. The first and major factor was the slow rate of adaptation and diffusion of major technological changes in the United States steel industry, in particular that of the oxygen steel furnace, the electric furnace and continuous casting technologies. The oxygen steel technology, which spread in the European steel industry in the 1950s, may be considered as the most efficient method of large-scale steel production replacing the outdated technology of the open hearth furnace. Its advantage over the open hearth furnace technology lies in lower costs and higher productivity. The electric furnace is another efficient method of production although it is only applicable for certain types of steel products. However, the American steel industry was slow in adopting these technologies and has continued to maintain a sizeable amount of open hearth capacity. Even in the 1970s and 1980s the American steel industry was far behind Japan with respect to adaptation to new technologies. Although market pressure has forced the American industry to replace the outdated open hearth facilities with basic oxygen furnace (BOF) and electric furnace technologies, as late as 1988 5.2 per cent of American crude steel was still produced by the open hearth method. Production processes in Japan, EEC, Republic of Korea and Taiwan Province of China are entirely based on BOF and electric furnaces. 5/ The rate of adoption of new technologies by the industry is also very high for Brazil (99 per cent) in contrast to low rates of adaptation in Eastern Europe, India and some other developing countries. American producers were also slow in adopting continuous casting (CC), which is another major advance in steelmaking technology. Continuous casting reduces the number of production steps, avoids reheating of ingots before transformation and produces a semi-finished shape in one single continuous process. Its advantages over traditional methods are higher yield and lower energy cost as well as greater labour productivity. The American steel industry is considered to be far behind its counterparts in Taiwan Province of China, Japan, the Republic of Korea and EEC as far as adaptation of continuous casting technology is concerned. The high rate of adoption in Japan and some developing countries reflects the recent vintage of their plant, which facilitates incorporation of new technologies. 6/

20. The steel industry is one of the most heavily unionized industries in the United States, with a long history of mistrust and conflict between labour and management. Government involvement in labour negotiations in several instances in the industry has tended to tolerate higher steel prices in return for labour stability. The wage/productivity gap in the industry became particularly damaging over the 1972-1977 period: whereas steel workers' earnings increased by 68 per cent, productivity rose by only 3 per cent. 7/

21. The oligopolistic structure of this industry, marked by a pattern of price leadership, has allowed high prices to be maintained even in periods of depressed demand. This differs from the behaviour of the industry in Japan where despite its similar oligopolistic structure, it responded to market pressure by cutting prices at a time of depressed demand. 8/

22. A fourth important factor consisted of the depletion of high-grade iron ore deposits in the United States. Until the 1960s such deposits had provided cheap raw materials and hence gave an important competitive advantage to the American steel industry.

23. The initial imposition of the first VERs in 1968 did not remain a temporary measure. As the competitive decline of the United States steel industry continued, the country also continued to rely on protectionist policies. This has been so since 1968. Pressure for protection grew strongly in the second half of the 1970s, following the first oil shock and the subsequent deep recession. A sharp decline in demand for steel in the second half of the 1970s, combined with the substantial over-capacity and the continued competitive decline of the United States industry, led in 1977 to the imposition of a Trigger Price Mechanism (TPM) in the United States. TPM implied that imports below these prices, based on presumed Japanese production cost, would trigger off an anti-dumping investigation. The TPM was a discriminatory measure. Although primarily aimed at Japanese imports, it also acted generally against low-cost suppliers, including emerging exporters in developing countries, such as Taiwan Province of China. Positive findings resulted in the levying of definitive anti-dumping fines. 9/ Furthermore, genuine low-cost producers were intimidated from supplying the market because of the uncertainty associated with the investigation, which was a time-consuming and costly process. TPM, however, resulted in a dramatic cut in the share of Japanese imports to the American market while highly subsidized EEC producers increased their shares in the same market. Consequently, TPM was not considered by the American steel industry to be sufficient relief against growing import penetration of the United States domestic market. TPM was terminated in 1982.

24. Instead, the United States concluded a VER agreement with EEC in 1982 and another one with Japan in 1983. Simultaneously, several NICs increased their sales in the United States market, taking advantage of the void left by European and Japanese producers. 10/

25. American steel trade policy became even more protectionist and restrictive after 1984, as before that date the United States had not yet generalized the VER system to exporters from developing countries. However, a full-fledged fight against growing import penetration including imports from NICs was launched in 1984, at a time when the United States industry suffered from declining productivity, unemployment, over-capacity and financial losses. The domestic industry pressed its case by simultaneously lobbying for legislated protection in Congress, and seeking relief under the escape clause, enterprises requested that quantitative limits be negotiated by the executive branch with foreign suppliers. These were the same routes that had been followed by the American steel industry in 1968. The policy outcome of protectionist pressure was that the United States concluded VERs initially for a five-year period with 29 of its trading partners including seven developing countries: Brazil; Republic of Korea; Mexico; Taiwan Province of China; Trinidad and Tobago; Venezuela; and Yugoslavia. 11/ The VERs were scarcely

"voluntary" since the United States itself administered the import licences. 12/ The explicit goal was to reduce imports to around 20 per cent of the domestic market. In exchange for agreeing to these limits, VER countries were relieved from various anti-dumping and countervailing duty orders that had been imposed on their exports in the early 1980s.

26. The potential beneficiaries of the United States steel trade programme of 1984 were established domestic and foreign suppliers who would have lost the domestic market shares to more efficient new producers in the absence of that programme. The programme guaranteed them a protected share of the American market. This applies to the European Economic Community as well as to Japanese producers who had lost much of their comparative advantage to new exporters from NICs. Other beneficiaries were unrestrained foreign suppliers, of which Canada was by far the largest. Conversely, those new least-cost suppliers which could have otherwise expanded their share in the United States market, i.e. the NICs included in the VER agreement, were the main losers. 13/ For instance, exports from the Republic of Korea, which had supplied 2.23 million tons of steel to the United States prior to the 1984 VER agreement, fell to 1.89 million tons in 1985 and 1.51 million tons in 1986.

27. The strong impact of the United States protectionism on exports from developing countries since 1984 is reflected in the declining import penetration ratio of developing countries in the United States steel market. This rate declined from 3.2 per cent in 1984 to 2.3 per cent in 1985, while in preceding periods it had increased substantially, from 0.7 per cent in 1975 to 3.2 per cent in 1984.

28. The new United States steel policy announced on 25 July 1989 involved the extension of VERs for two and a half years beyond their scheduled termination on 30 September 1989. This prolongation of protectionism has not been welcomed, certainly not by Brazil and the Republic of Korea which had sought bigger quotas. Countervailing duties and anti-dumping measures have been another tool frequently used to control steel imports. These measures have affected imports of various steel products from Canada, Japan and Sweden, as well as from a number of developing countries and territories, including Argentina, Brazil, India, Republic of Korea, Singapore, Taiwan Province of China, Thailand and Turkey.

29. This continued need for, and reliance on, protectionist policies reflects the late and slow response of American industry to market pressure. Of course market pressure did force the American industry to take certain measures including plant closures, reduction in capacity and worker lay-offs. Plant closures by integrated steel companies were quite significant over the 1977-1985 period and involved essentially several furnaces, production facilities for bars, wire rods, structural shapes, pipes and tubes, as well as for hot-rolled plates and other products. 14/ Between 1983 and 1987, United States steel-making capacity was reduced by one quarter. Employment in the industry had also declined sharply during the 1970s and 1980s: it dropped by 60 per cent between 1974 and 1988, the equivalent of more than 300,000 workers (see table 9).

30. Nevertheless, these measures were taken too late to remedy the continued decline of the United States steel industry, a decline which had started in the 1950s. However, one important development in the American steel industry since the 1960s has been the emergence of mini-mill producers. This group of

producers, which operate on a smaller scale than large integrated companies, has been an important source of competitive change in the market because of its flexibility and lower costs. Mini-mill producers are involved in the production of a small number of products, such as wire rods and bar products, owing to limited applications of mini-mill technology to a wider range of steel products. Therefore, their overall share in total steel production in the United States is still limited.

31. The United States Government has not played a directive role in speeding up or promoting rationalization of the industry. Instead, it has relied on protectionist measures and their intensification through time. United States trade policy has been used as the main instrument to aid the declining steel industry without a detailed intervention programme. Furthermore, the process of structural adjustment in the industry has followed an ad hoc approach; neither the Government nor industry had been willing to take appropriate measures until market pressures became unbearable. The lack of an appropriate corporate strategy was manifested in the slow adoption of efficient technologies by the industry as well as its large wage-productivity gap. Notably, since 1984 the system of VERs has been extended to exporters from developing countries, and United States steel trade policy has become the most protectionist among DMECs.

32. Recently, the United States took the initiative of negotiating an agreement with all major steel-exporting countries to limit domestic subsidies and progressively phase out government support for their steel industries. This commitment forms part of the new series of bilateral agreements in tandem with new quotas under the renewed VER arrangements.

B. Structural adjustment and protectionism in the European Economic Community

33. The recession of 1975 badly damaged the EEC steel industry, which was already burdened with considerable over-capacity at that time, following a prior period of optimistic market conditions with enlargement of production capacity. Faced with slackening demand within the European Economic Community, producers stepped up price competition such that prices fell by an average of 45 per cent between 1974 and 1977. This led to substantial financial losses amounting to a total of US$ 4 billion in 1977 and a growing debt burden for the industry. 15/

34. In response to the worsening situation in the industry, a number of measures were taken by the European Commission from 1977 onwards. These measures were based on the Treaty provisions for the European Coal and Steel Community (ECSC) and included the following:

(a) A voluntary agreement concluded between major ECSC producers in 1977 to limit their steel production in order to prevent a further fall in prices at the time of sluggish demand - this was implemented by creating a Community-wide steel producers cartel, known as "Eurofer 1".

(b) Setting of minimum prices in the Community for certain steel products since 1977 - the purpose was to improve prices and the financial situation of the steel industry in the Community.

(c) Introduction of an import monitoring system for effective protection of the "cartel" - an intensified system of import monitoring coupled with a Basic Price System (BPS) was introduced later in 1977. BPS, which was based on Japanese production costs, was similar to the TPM in the United States. Imports below threshold prices resulted in an immediate anti-dumping investigation. Substantial over-capacity in the EC steel industry, a secular decline in demand, combined with the competitive decline of the Community steel industry, also led to the imposition of VERs with Japan in 1976.

(d) BPS was removed in 1978 and replaced by VERs with major exporters. The imposition of BPS in 1977 had followed a large number of anti-dumping complaints: the European Commission offered to withdraw simultaneously the BPS and the anti-dumping investigation for those exporters which agreed to conclude a VER with the Community. Under the VER, exporters were allowed to sell to the EEC below the reference prices. In 1978, VERs were concluded with the EFTA countries (Austria, Finland, Norway, Sweden and Switzerland), East European countries and main exporters from developing countries including the Republic of Korea, Brazil and Venezuela. In other words, EC generalized the VER system to include virtually all exporters. EC trade policy did not change until very recently and has been only partially relaxed since 1989. Since the second half of the 1970s protectionist policies of EEC have inhibited any significant increase of the import penetration ratio by developing countries (see table 8).

(e) Imposition of production quotas on EC steel producers in 1980 - despite the imposition of the above measures, EC-industry suffered substantial financial losses from 1977 to 1980. The voluntary agreement between European producers to limit production (measure 1) was shattered owing to sluggish demand. Prices fell substantially and financial losses became unmanageable. As a result, the Council of Ministers agreed in October 1980 to the declaration by the European Commission of a state of "manifest crisis" in the industry under the ECSC Treaty. This declaration allowed the European Commission to impose mandatory restrictions on steel production and deliveries in the Community (i.e. in the form of quarterly quotas). The system of production quotas was in force until mid-1988, when it was replaced by statistical surveillance of production and deliveries for certain sensitive ECSC products. 16/

(f) State Aids since 1980 - under article 4 (c) of ECSC Treaty, all forms of subsidies to the industry are prohibited. However, this provision was amended by the European Commission following the declaration of crisis in the industry. The Commission established rules under which state aid could be granted temporarily to the industry until 31 December 1985. The state aids were subject to the following conditions: (i) they had to be linked to a clear restructuring programme designed to make the company concerned more competitive and restore its financial viability; (ii) they were limited in duration; (iii) member States were obliged to notify the European Commission of their plans and proposals for restructuring and (iv) aids should not create unacceptable distortions of competition. State aids were also made conditional on the reduction of production capacity by the member States. Total state aid to the Community steel industry over the period 1 February 1980 to 31 December 1985 amounted to 36 billion ECU. The largest state aid went to the industry in Italy followed by France, United Kingdom and Belgium. In these countries, government played a prominent role in ownership of the industry over this period. In contrast in Germany, where state

ownership of the industry had been quite limited in the west, such aid was not as significant. 17/ The provision of state aid facilitated restructuring of the industry, including a significant reduction in production capacity but did not achieve fully its targets. Since December 1985, the general rule has been the termination of state aid in EEC member States, unless directed at research and development, plant closures, and environmental protection. 18/ However, some exceptions to the general rule have been made since then, the most controversial being the extended authorization of state aid to the Italian public steel company and its successor. Other exceptions to the rules were made for Spain and Portugal, due to special arrangements during the transitional period for EC accession. 19/

(g) A distinct Community programme was originally introduced in 1980 to assist in the reconversion of regions particularly affected by the crisis in the steel industry. As part of the Communities' regional policy, this programme aimed at the creation of new alternative economic activities in such areas through joint financing of multi-annual special programmes by the European Development Fund as well as by member States. These programmes for specially designated areas related to improvement of the physical and social infrastructure so as to attract new enterprises (such as construction or modernization of housing for workers, the conversion of disused industrial buildings, etc.); the establishment of common services for new undertakings; the promotion of innovation; and financial and technological support to small- and medium-scale enterprises. This programme was reconducted in a revised form in 1988 as the "RESIDER PROGRAMME" (Community programme to assist the conversion of steel areas). 20/

(h) The Community also grants substantial financial support to research and development programmes for technological or product innovation. Important joint programmes are, for example, under way by Community steel enterprises regarding new materials and alloys to enhance the quality and use of steel vis-à-vis competing products.

(i) The flexible authorization of mergers among EC producers since the late 1970s has led to increasing concentration of the steel industry in Europe. Although the reason for authorization of mergers is rationalization of the industry, the actual impact of these mergers is difficult to access.

35. The EEC steel industry has experienced an "orderly process of restructuring" since the late 1970s. It has become more competitive and is characterized by a substantial trade surplus unlike its American counterpart which is a net importer. Above all, EEC trade policy has become more liberal, with the removal of VERs with Japan in 1986 and with EFTA countries in 1988: VERs with Eastern Europe and certain developing countries, however, continued, although ingots and semis (SITC - 672) have been removed from the list of negotiations, i.e. there is no quantitative limitation on imports of these products to EEC. Other ceilings have been raised periodically. Nevertheless, there is still substantial over-capacity in the industry, which can lead to the intensification of protectionist measures at a time when depressed demand means that adjustment needs to be continued. 21/ Furthermore, this partial lifting of quantitative ceilings has further increased the effective protection of EEC-steel producers vis-à-vis imports from developing countries for processed and finished steel products. This escalation of effective protection by means of ceilings accentuates existing tariff escalation, which goes in the same direction and particularly affects those developing country

producers which may not benefit from GSP (owing to temporary country exclusions, for example the Republic of Korea, or owing to GSP ceilings and safeguards for competitive reasons).

C. Structural adjustment in Japan

36. The Japanese steel industry did not begin a severe decline until the global recession of 1982, notably in the face of increased competition from new exporters from developing countries. The industry was hit particularly hard by the appreciation of the yen in 1985. The depressed state of key consumer industries following the yen's appreciation led to a fall in domestic consumption of steel. Growing import penetration into the Japanese market by NICs as well as a reduction in exports and export profits were other effects. The six leading steel producers together suffered losses amounting to 400 billion yen in 1986.

37. The response has been a change in corporate strategy by leading producers which devised their own rationalization plan in late 1986. The rationalization plans aim at two distinct objectives: (i) to cut, reduce and modernize productive capacity; (ii) to diversify into new fields. As its contribution to this rationalization plan, the leading Japanese steel producer, Nippon Steel Corporation, planned to close down five of its 12 furnaces by 1990. NKK Corporation, Sumitomo Metal Industries, and Koha Steel are expected to shut down one furnace each. These rationalization plans are under way. 22/

38. Over a short space of time, between 1987 and 1990, employment in the industry was expected to decline by more than 45,000 workers, although the number of workers in the industry had already been substantially reduced in the early 1980s. Overall employment in the Japanese steel industry declined by 150,000 workers, or one third, between 1974 and 1988 (see table 9).

39. The process of diversification into new fields started before the appreciation of the yen. As a strategic management measure to improve profitability, diversification is important in two respects; firstly, as a means of absorbing surplus labour from the steel-making sector and, secondly, as a means of utilizing steel-making technologies in new business fields. Broadly speaking, new fields of interest are of three types: (i) coal chemistry, (ii) new materials, including new metal alloys and fine ceramics; (iii) services including data processing and service industries. For example, since 1988, Nippon Steel Corporation has been in the process of developing and marketing fine ceramics and superminicomputers, for which joint-ventures have been established with overseas producers in the Netherlands and the United States. It is also expanding into services. The company planned to generate more than half of its sales in business fields other than steel-making by 1995. Similarly, NKK intends to diversify into urban development, electronics and biotechnology.

40. Through the Ministry of International Trade and Industry (MITI) the role of the Japanese Government has been very important in directing and

formulating industrial policies. MITI concluded that Japan's crude steel production will follow a downward trend by 1990 (table 10). However, so as to boost the declining demand for steel, the Government has taken measures since 1987 to expand domestic demand by increasing expenditures on public works. This has given rise to a construction boom and has also stimulated an increase in demand for automobiles and electric home appliances. In fact, Japanese steel policy seems to have shifted more and more from exports towards production for the domestic market.

IV. PROSPECTS FOR DEVELOPING COUNTRIES

41. The structural adjustment policies in developed countries have partially achieved the aim of relieving the market from the pressures of heavy over-capacity. Despite long-lasting protection, large subsidies and other state aids, however, the problem is far from being resolved. As long as substantial over-capacities continue to persist, pressures for protection by the industry are likely to continue to over-shadow export prospects for developing countries. In spite of recently increased flexibility, VERs have proven their efficiency as a drastic means for curtailing and restricting developing countries' export dynamics in that industry.

42. Supply-side constraints also limit steel exports in some developing countries. In countries such as Brazil, Venezuela, India and Mexico, individual enterprises have an important backlog of needs to replace ageing equipment and technologies and to readjust production to changing patterns of demand, for example, from round to flat products to meet more dynamic demand trends. However, investments for modernization or expansion have been seriously hampered for many years by lack of capital and by foreign exchange shortages.

43. Other developing country steel producers, such as the Republic of Korea, have experienced major changes in export prospects owing to the substantial appreciation of their national currency, and a rapid rise in domestic labour cost. These factors have critically reduced their international competitive advantages.

44. At the same time, the steel industry is undergoing major structural change in several developing countries. Major Latin American steel producer countries such as Brazil, Mexico and Venezuela began recently to deregulate their steel industry and to privatize or decentralize their nationalized enterprises. Important financial support and investment programmes have also been launched in several Latin American, South East Asian and Arab countries in order to put ailing enterprises back on a sound footing. In several cases, international co-operation with leading world steel producers has been sought for that purpose. In some countries, price policies have also been liberalized or import regulations rendered more liberal to intensify external competition.

45. Some developing countries, as for instance Brazil and Venezuela, pursue ambitious investment programmes to increase their steel production and export capacity, partly on a joint-venture basis with foreign steel companies. Other important steel investments, such as those in Egypt and Thailand are mainly planned to cater to the dynamically growing domestic and sub-regional markets.

46. Korean steel producers, pursue corporate policies following the lines of their Japanese precursors to cope with the new pressures for structural adjustment. On the one hand, production is shifting more and more from exports towards a domestic market orientation. On the other hand, the Korean steel industry is attempting to upgrade its technological level and move towards higher steel qualities, such as specialty steels. In this context, Korean firms are also undertaking major outward investments. They envisage, inter alia, the purchase of specialized steel companies in North America.

47. In spite of significant structural adjustment efforts and investment programmes in the steel industry of developing countries, prospects for the future development of steel exports to the world market are not particularly bright. The success of such programmes would require as a corollary that protectionism of major developed countries be rolled back and that a lasting solution be found to resolve the persistent problem of protectionism.

48. World demand is likely to stagnate on the medium-term horizon. Major reasons include a substantially lower consumption of steel, owing partly to the more efficient use of steel in the production of finished steel products and in user industries, and partly to switching to substitutes such as aluminium and plastics. Furthermore, consumption in developed countries will be affected by shifts towards less steel-intensive economic activities and services, and slower growth of major user industries, as consumption of their products approaches saturation levels.

49. The development potential for the steel industry in developing countries will reside, to significant extent, in domestic market growth, the development of major user industries, and their export capacities and rationalization. For the time being, average per capita consumption of steel in developing countries is still far below that of developed countries. OECD projections predict an increase in production capacity in developing countries of about 20 per cent over the period 1988 to 1995 (table 10).

50. Persistent excess capacity in the developed countries will make it necessary for them to continue their restructuring efforts. This is likely to involve further cuts in capacity and employment and rationalization of production. According to OECD projections, OECD steel-making capacity is likely to be reduced by a further 10 per cent between 1988 and 1995. Notwithstanding these further pressures for adjustment, protectionism must be resisted, and protectionist measures progressively reduced. Instead, more emphasis should be placed on active restructuring policies and on assisting steel enterprises to diversify into further processing or into other industries.

Notes

1/ World Steel Dynamics, Paine Webber, WSD, New York, 1989.

2/ See also Industrie et Développement dans le Monde, Report 1988/89, UNIDO pp. 236-251, Vienna, 1989.

3/ Kent Jones, Politics versus Economics in World Steel Trade, London, 1986.

4/ Kent Jones, op. cit.

5/ World Steel in Figures, by the International Iron and Steel Institute, 1989.

6/ World Steel in Figures, op. cit.

7/ Kent Jones, op. cit.

8/ W. Adams and H. Mueller, "The steel industry" in: The Structure of American Industry (pp. 73-133), New York, 1982.

9/ Kent Jones, op. cit.

10/ J. McKinney and K.A. Rowley, "Voluntary Restraint Arrangements and Steel Imports", Journal of World Trade, Vol. 23, No. 3, June 1989.

11/ Review of Developments in the Trading System, September 1989 - February 1989, L/6530, GATT, July 1989, pp. 161 ff.

12/ R. Pomfret, "World Steel at a Cross-roads", Journal of World Trade, Vol. 22, No. 3, June 1988.

13/ R. Pomfret, op. cit.

14/ William Hogan, US Steel Industry in the 1980s, Laxington, 1984, Blackhurst and Curzon, Structural Adjustment in the Global Steel Industry, Geneva 1989 (et alia).

15/ W. Hogan, op. cit.

16/ Commission Decision No. 2448/88/CECA of 19 July 1988, in OJ No. L 212 of 5 August 1988.

17/ Report on Competition Policy 1987, Commission of the European Communities.

18/ Commission Decision No. 322/89/ECSC of 1 February 1989, in OJ No. L 38/8 of 10 February 1989 as well as Commission Decisions Nos. 3484/85/ECSC in OJ No. L 340 of 18 December 1985 and No. 2320/81/ECSC of 7 August 1981 in OJ No. 228 of 13 August 1981.

19/ See seventeenth and eighteenth Reports on Competition Policy, Commission of the European Communities, Brussels, Luxembourg, 1988 and 1989.

20/ Council Regulations (EEC) No. 328/88 of 2 February 1988 in OJ No. L/33 and No. 2616/80 of 7 October 1980 in OJ No. L/271.

21/ See Panorama of EC Industry 1989, chapter 3, Commission of the European Communities, Brussels, Luxembourg.

22/ Japan's Iron and Steel Industry 1988, Mitsui & Co., Tokyo, 1989.

STATISTICAL ANNEX

Table 1

Crude steel: production

(000 tons)

Country	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988
WORLD	445 929	593 222	644 186	715 091	711 530	647 582	662 981	710 569	717 828	712 547	734 898	777 298
DEVELOPED MARKET-ECONOMY COUNTRIES	305 905	393 748	386 125	401 171	397 996	331 337	335 731	367 141	365 020	341 619	348 925	377 807
NORTH AMERICA	128 396	130 509	118 842	119 691	126 955	79 515	89 594	98 660	94 725	88 133	95 644	105 186
Canada	9 134	11 200	13 025	15 901	14 811	11 865	12 832	14 699	14 637	14 081	14 737	15 056*
United States	119 262	119 309	105 817	103 790	112 135	67 641	76 762	83 941	80 068	74 032	80 877	90 090
EUROPE	127 281	158 404	150 931	153 058	152 405	137 244	135 990	148 497	149 602	139 107	139 282	151 188
EEC	118 300	146 271	138 292	139 895	139 769	124 981	123 222	134 395	135 691	125 608	125 998	137 319
Belgium-Luxembourg	13 745	18 072	16 204	16 939	16 074	13 405	13 450	15 287	14 628	13 420	13 085	14 883
Denmark	-	-	-	734	612	560	493	548	528	632	605	650
France	19 599	23 773	21 530	21 176	21 258	18 417	17 582	19 005	18 815	17 670	17 432	18 584
Germany, Fed.Rep.of	36 821	45 041	40 415	43 838	41 610	35 880	35 729	39 389	40 497	37 134	36 248	41 023
Greece	-	-	-	935	909	933	868	895	985	1 010	908	959
Ireland	-	-	-	2	33	61	141	166	203	208	220	272
Italy	-	17 280	21 840	26 501	24 777	24 003	21 811	24 062	23 898	22 883	22 859	23 762
Netherlands	-	5 040	4 830	5 272	5 472	4 352	4 483	5 738	5 519	5 283	5 082	5 518
Portugal	-	390	420	578	555	505	670	687	663	717	732	811
Spain	3 515	7 429	11 242	12 643	12 896	13 160	13 009	13 497	14 233	11 882	11 691	11 795
United Kingdom	27 439	28 291	20 098	11 277	15 573	13 705	14 986	15 121	15 722	14 769	17 136	19 062
EFTA	8 981	12 133	12 639	13 163	12 636	12 263	12 768	14 102	13 911	13 499	13 284	13 869
Austria	3 221	4 079	4 068	4 624	4 656	4 258	4 411	4 868	4 663	4 292	4 301	4 561
Finland	362	1 169	1 618	2 508	2 429	2 420	2 416	2 634	2 518	2 586	2 668	2 798*
Norway	686	869	919	865	847	775	896	916	930	836	851	910*
Sweden	4 712	5 496	5 614	4 237	3 770	3 900	4 210	4 706	4 813	4 710	4 598	4 779
Switzerland	-	520	420	929	934	910	835	978	987	1075	866	821
SOUTH AFRICA	3 505	4 593	6 367	9 078	8 991	8 320	7 004	7 732	8 507	9 055	8 836	8 709
ASIA				110 510	101 790	99 665	97 252	105 676	105 381	98 385	98 629	105 801
Israel				115	114	115	83	92	100	110	116	120
Japan	41 161	93 322	102 313	111 393	101 676	99 550	97 169	105 584	105 281	98 275	98 513	105 681*
OCEANIA	5 562	6 920	7 672	7 834	7 855	6 593	5 891	6 576	6 805	6 939	6 534	6 923
Australia	5 500	6 820	7 480	7 594	7 635	6 371*	5 657*	6 303*	6 578*	6 703*	6 125*	6 400*
New Zealand	62	100	192	240	220	222	234	273	227	236	409	523
DEVELOPING COUNTRIES AND TERRITORIES	17 696	25 571	37 603	63 713	66 187	69 175	72 430	79 430	85 491	90 471	98 855	109 126
AFRICA				2 560	2 767	3 109	3 071	3 066	3 587	3 449	4 095	4 481
Algeria	23	330	221	388	557	868	950	1 080	1 414	1 400	1 400	1 500
Angola	-	33	41	30	30	30	20	20	10E	10E	20E	-
Cameroon				10	10	10	6	6	5E	5E	5E	-
Côte d'Ivoire				5	5	-	-	-	-	-	-	-
Egypt				1 153	1 141	1 161	1 050	1 150	950E	1 000	1 700*	2 000*

Table 1 (continued)

Crude steel: production

(000 tons)

Country	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988
DEVELOPING COUNTRIES AND TERRITORIES (cont'd)												
AFRICA (cont'd)												
Ethiopia				5	5	5	-	-	-	-	-	-
Ghana				15	5	5	5	2	-	-	-	-
Kenya				10	10	10	-	-	-	-	-	-
Libyan Arab Jamahiriya				20	20	20	10	8	10E	10E	10E	10E
Mauritania				10	10	10	5	5	2E	5E	7E	5E
Mauritius				10	10	10	-	-	-	-	-	-
Morocco				7	5	5	4	4	5E	6E	5E	5E
Mozambique				15	15	15	182	187	254	134*	137*	139*
Nigeria				5	5	5	-	-	-	-	-	-
Senegal				5	5	5	-	-	-	-	-	-
Tunisia				177	168	175	163	152	177	181	188	195
Uganda				15	15	15	8	8	8E	8E	10E	10E
United Rep.of Tanzania				10	10	10	-	-	-	-	-	-
Zaire				30	10	10	6	6	6E	6E	6E	5E
Zimbabwe				600	691	700	647	423	731	674	597	602
AMERICA				29 058	27 281	27 031	28 918	33 458	36 026	37 721	39 980	42 639
Argentina	1 370	1 823	2 198	2 687	2 526	2 900	2 942	2 647	2 939	3 242*	3 603*	3 624*
Bolivia				6	6	5	5	5	5E	5E	-	- *
Brazil	2 983	5 390	8 308	15 215	13 226	13 000	14 671	18 385	20 454	21 228*	22 228*	24 650*
Chile	476	592	490	715	641	480	611	690	684	703	715	899
Colombia				360	395	400	463	502	530	601	694	754
Costa Rica				7	6	5	-	-	-	-	-	-
Cuba				330	330	301	354	338	408	411	402	363
Dominican Republic				5	6	5	-	-	-	-	-	-
Ecuador				16	26	30	22	17	18	17	25	23
El Salvador				40	35	35	30	50	40E	40E	40E	50E
Guatemala				7	6	5	5	10	10E	10E	10E	10E
Honduras				6	5	4	4	8	8E	8E	8E	10E
Mexico	2 455	3 881	5 727	7 065	7 605	7 060	6 917	7 482	7 299	7 225*	7 642*	7 805*
Nicaragua				6	5	4	4	4	5E	5E	5E	5E
Panama				6	10	8	15	-	-	-	-	-
Peru	94	94	431	447	364	272	299	337	368	462	455	400
Trinidad and Tobago				-	45	219	210	172	164	331	388	363
Uruguay				18	14	20	46	41	39	31	30	29
Venezuela	624	927	1 069	2 077	2 030	2 278	2 320	2 770	3 055	3 402	3 735	3 654
ASIA				28 461	32 163	35 185	35 962	38 674	41 398	44 782	50 413	57 519
Bangladesh				131	134	78	58	88	122	116	120	120E
Myanmar				40	45	40	20	20	20E	32*	30E	30E
Hong Kong				74	80	80	120	120	120E	120E	120E	120E
India	6 413	6 232	7 829	9 514	10 780	11 000	10 237	10 549	11 543	12 197	13 098	14 309
Indonesia				543	621	693	983	1 171	1 314	1 724	2 100	1 900
Iran (Islamic Rep.of)				300	750	1 200	1 200	1 200	1 200	1 200	1 200	1 200
Iraq				100	70	100	50	50	-	-	-	-

Table 1 (continued)

Crude steel: production

(000 tons)

Country	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988
DEVELOPING COUNTRIES AND TERRITORIES (cont'd)												
ASIA (cont'd)												
Jordan				75	100	120	40	40	40E	40E	30E	30E
Kuwait				140	230	240	100E	100E	140E	100E	100E	100E
Lebanon				15	14	6	-	-	-	-	-	-
Malaysia	-	50	195	210	210	215	350	350	400	400	550	550E
Pakistan				20	120	130	150E	150E	150E	150E	150E	150E
Philippines	-	60	311	430	400	370	200	250	250	209*	261*	252*
Qatar				400	455	400	469	479	533	507	492	529
Republic of Korea		480	1 990	8 558	10 753	11 750	11 915	13 033	13 540	14 555	16 782	19 118
Saudi Arabia				100	150	150	400	842	1 106	1 100	1 365	1 614
Singapore				320	350	350	305	362	365E	390	422	400E
Syrian Arab Republic				140	400	400	100	100	70E	70E	60E	60E
Taiwan Province of China	-	400	1 010	4 225	3 471	4 080	5 031	5 010	5 088	5 545	5 915	8 514
Thailand	6	156	230	450	460	450	350	381	425	450	534	500E
Turkey		1 310	1 700	2 536	2 425	3 183*	3 834*	4 330*	4 862*	5 927*	7 044*	7 983*
United Arab Emirates				140	145	150	50	50	50E	50E	40E	40
EUROPE	1 769	2 228	2 916	3 634	3 976	3 850	4 134	4 232	4 480	4 519	4 367	4 487
Yugoslavia	1 769	2 228	2 916	3 634*	3 976*	3 850*	4 134*	4 232*	4 480*	4 519*	4 367*	4 487*
SOCIALIST COUNTRIES OF EASTERN EUROPE	119 098	156 018	192 614	209 157	206 127	204 450	210 025	214 223	214 023	221 649	224 368	224 403
Bulgaria	588	1 800	2 265	2 567	2 482	2 580	2 825	2 878	2 926	2 898	3 044	2 880
Czechoslovakia	)			14 925	15 271	15 000	15 024	14 831	15 036	15 112	15 416	15 379*
German Dem. Republic	) 15 484	20 015	24 475	7 308	7 467	7 250	7 219	7 573	7 840	7 967	8 243	8 133
Hungary	)			3 767	3 646	3 720	3 617	3 751	3 647	3 715	3 622	3 503
Poland	9 000	11 800	15 000	19 484	15 719	14 000	16 236	16 553	16 126	17 144	17 146	16 885*
Romania	3 026	6 517	9 549	13 175	13 025	12 900	12 593	14 437	13 795	14 276	14 962	14 500
USSR	91 000	115 886	141 325	147 931	148 517	149 000	152 511	154 200	154 653	160 537	161 935	163 046
SOCIALIST COUNTRIES OF ASIA	13 230	17 880	27 840	41 050	41 220	42 620	45 140	49 775	53 294	58 808	62 750	65 962
China	12 000	15 700	25 000	37 040	35 600	37 000	39 040	43 475	46 794	52 208	56 020	59 132
Dem. P. Rep.of Korea	1 230	2 180	2 840	4 000	5 500	5 500	6 100	6 300	6 500	6 600	6 730	6 830
Viet Nam				10	120	120	-	-	-	-	-	-

Source: UNCTAD data base, compiled on the basis of questionnaires and various complementary sources.

Notes: E = Estimated.
* = Data supplied by Governments.

Table 2

(Crude steel) production
% share of various regions

	1965	1970	1975	1980	1985	1986	1987	1988
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Developed market economies	67.1	66.4	59.9	56.1	50.9	47.9	47.5	48.6
U.S.A.	26.2	20.1	16.4	14.5	11.1	10.4	11.0	11.6
Europe	27.9	26.7	23.4	21.4	20.8	19.5	19.0	19.4
EEC (12)	25.9	24.7	21.5	19.6	18.9	17.6	17.1	17.7
EFTA	2.0	2.0	2.0	1.8	1.9	1.9	1.9	1.7
Japan	9.02	15.7	15.9	15.6	14.7	13.8	13.4	13.6
Others	3.98	3.9	4.2	4.7	4.3	4.2	4.1	4.0
Developing countries	3.9	4.3	5.8	8.9	11.9	12.7	13.4	14.0
Africa	n.a.	n.a.	n.a.	0.3	0.5	0.5	0.6	0.6
America	n.a.	n.a.	n.a.	4.1	5.0	5.3	5.4	5.5
Asia	n.a.	n.a.	n.a.	4.0	5.8	6.3	6.8	7.3
Europe (Yugosl.)	0.39	0.4	0.5	0.5	0.6	0.6	0.6	0.6
Socialist countries of Eastern Europe	26.1	26.3	29.9	29.2	29.8	31.1	30.5	29.0
USSR	20.0	19.5	21.9	20.7	21.5	22.5	22.0	21.0
Others	6.1	6.8	8.0	8.5	8.3	8.6	10.5	8.0
Socialist countries of Asia	2.9	3.0	4.3	5.7	7.4	8.3	8.6	8.4
China	2.6	2.6	3.9	5.2	6.5	7.3	7.6	7.6
Others	0.3	0.4	0.4	0.5	0.9	1.0	1.0	0.8

Source: Table 1

Table 3

Index numbers of apparent world steel consumption
1980=100

Country or Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
World	83	100	104	100	98	91	93	99	101	99	103	109
Developed countries	99	103	109	100	99	83	83	93	91	87	91	103
USA	117	127	123	100	112	74	82	98	92	83	89	99
EEC a/	99	96	106	100	91	87	83	88	86	88	88	103
Japan	80	84	99	100	90	88	83	94	93	88	96	110
Developing countries	80	87	95	100	101	101	96	98	105	99	105	113
Latin America	83	83	90	100	93	80	64	77	79	87	92	88
Asia	76	89	98	100	108	113	114	112	122	129	143	165
Africa + Middle East	82	88	97	100	100	110	111	105	113	73	68	73
Socialist countries	98	102	101	100	98	98	101	102	102	105	104	104
China	70	99	104	100	91	95	121	140	166	172	182	183

a/ 12 Member States

Source: Indices calculated on basis of IISI data (1988, in million tons)

Table 4

Share of different groups of countries in increased production of crude steel

	1970 - 1988		1980 - 1988	
	Change in production million tons	%	Change in production million tons	%
World	+184.1	100	+ 62.3	100
Developed market-economy countries	- 15.9	- 8.6	- 23.4	- 37.5
Developing countries	+ 83.4	+ 45.3	+ 45.4	+ 72.9
Socialist countries: - Eastern Europe	+ 68.4	+ 37.2	+ 15.3	+ 24.5
Asia	+ 48.1	+ 26.1	+ 25.0	+ 40.1

Source: Table 1.

Table 5

World export of iron and steel
(% share) */

	1975	1980	1985	1987
World	100	100	100	100
DMEC	87.2	84.4	80.2	78.6
DC:	3.4	6.9	10.6	11.2
- Republic of Korea	0.5	2.4	2.9	2.9
- Brazil	0.4	1.2	2.8	2.6
- Taiwan Province of China	0.2	0.5	0.9	0.8
- Mexico	0.1	0.1	0.3	0.7
- Turkey	0	0.1	0.1	0.5
- Argentina	0.1	0.2	0.3	0.3
- Venezuela	0	0.2	0.4	0.3
- Indonesia	0	0.1	0.1	0.3
- Malaysia	0	0	0.1	0.2
- New Caledonia	0.7	0.5	0.4	0.2
- Zimbabwe	0.1	0.2	0.3	0.2
- Algeria, India, Philippines, Qatar, Saudi Arabia, Singapore, Thailand	) Each accounted for 0.1% of world export in 1987			0.7
Socialist countries:				
- Eastern Europe	5.0	4.8	4.6	4.4
- Asia	0.3	0.6	0.3	0.6

*/ These figures do not add up to 100 since not all countries are included.

Source: UNSO, COMTRADE data base.

Table 6

Imports of iron and steel by developed market economies
1980

	World	Developed market economies	Developing countries (DC)	Composition of DC's exports %	Share of main exporters from DC (in millions of US $)
67	44 769.4	39 282.4	2 539.3	100.0	Korea Rep. of (878.5), Brazil (541.1), New Caledonia (316.3), Dominican Rep. (131.7), Zimbabwe (127.9), Venezuela (89.9)
%	100	87.7	5.7		
671	4 131.8	2 851.6	1 050.9	41.4	New Caledonia (316.2), Brazil (227.4), Dominican Rep. (137.7), Zimbabwe (121.5), Indonesia (29.5), Venezuela (27.6)
%	100	69.0	25.4		
672	5 029.8	4 256.9	282.4	11.1	Korea Rep. of (165.5), Brazil (61.9), Venezuela (31.7), Taiwan Province of China (2.5), Egypt (2.7), Algeria (1.8)
%	100	84.6	5.6		
673	9 285.2	8 375.6	123.6	4.9	Korea Rep. of (39.3), Brazil (35.2), Mexico (9.1), Zimbabwe (6.4), Venezuela (5.5), Taiwan Province of China (2.0)
%	100	90.2	1.3		
674	13 787.4	12 510.6	566.9	22.3	Korea Rep. of (361.8), Brazil (166.9), Egypt (9.5), Taiwan Province of China (9.3), Philippines (5.9), Peru (3.1)
%	100	90.7	4.1		
675	2 094.1	1 985.8	5.1	0.2	Korea Rep. of (3.6), Brazil (0.8), Mexico (0.1)
%	100	94.8	0.2		
676	387.0	359.8	0.6	0.02	Korea Rep. of (0.3), Hong Kong (0.1)
%	100	93.0	0.2		
677	1 505.2	1 381.7	19.5	0.77	Korea Rep. of (13.5), Brazil (2.6), Taiwan Province of China (1.9), India (0.7), Mexico (0.2), Lebanon, Peru, Hong Kong (0.1)
%	100	91.8	1.3		
678	8 048.2	7 106.6	483.1	19.02	Korea Rep. of (275.2), Taiwan Province of China (58.2), Brazil (45.8), Venezuela (26.6), Mexico (26.0), Argentina (10.4)
%	100	88.3	6.0		
679	500.6	455.9	7.2	0.28	India (1.5), Korea Rep. of (1.3), Taiwan Province of China (0.9), Brazil (0.6), Philippines (0.5), Turkey (0.3)
%	100	91.1	1.4		

Source: UNSO, COMTRADE data base.

Table 7

Imports of iron and steel by developed market economies
1987

	World	Developed market economies	Developing countries (DC)	Composition of DC's exports %	Share of main exporters from DC (in millions of US $)
67	51 208.2	41 643.3	5 222.4	100.0	Korea Rep. of (1 518.2), Brazil (1 087.5) Taiwan Province of China (353.4), Mexico (304.5), Turkey (245.3), Indonesia (158.7)
%	100	81.3	10.2		
671	3 966.7	2 547.6	985.4	18.9	Brazil (282.5), Zimbabwe (123.5) Dominican Rep. (112.5), New Caledonia (105.4), Colombia (75.2), India (33.1), Turkey (31.1)
%	100	64.2	24.8		
672	7 790.0	5 827.0	1 107.8	21.2	Korea Rep. of (332.6), Brazil (319.7) Taiwan Province of China (95.1), Turkey (79.1), Indonesia (68.6), Mexico (40.5)
%	100	74.8	14.2		
673	9 484.12	7 962.1	668.0	12.7	Korea Rep. of (171.3), Brazil (100.9), Turkey (46.9), Indonesia (42.8), Trinidad-Tobago (42.5), Singapore (41.2)
%	100	84.0	7.0		
674	17 038.8	14 237.4	1 496.4	28.7	Korea Rep. of (638.3), Brazil (304.5), Mexico (120.4), Taiwan Province of China (108.4), Argentina (81.2), Venezuela (37.8)
%	100	83.6	8.8		
675	2 580.1	2 400.2	30.2	0.58	Korea Rep. of (11.6), Brazil (7.4), Taiwan Province of China (3.3), Mexico (2.8), Hong Kong (0.6), Singapore (0.5)
%	100	93.0	1.2		
676	313.3	287.0	4.4	0.084	Korea Rep. of (3.9), Brazil (0.1), Venezuela (0.1)
%	100	91.6	1.4		
677	1 879.6	1 664.6	84.5	1.62	Korea Rep. of (41.2), Taiwan Province of China (11.9), Brazil (8.8), Venezuela (4.2), Mexico (3.8), Bahamas (1.0)
%	100	88.6	4.5		
678	7 614.8	6 234.0	830.4	15.9	Korea Rep. of (311.2), Taiwan Province of China (103.4), Brazil (62.6), Mexico (62.6), Turkey (54.2), Thailand (51.2)
%	100	81.9	10.9		
679	540.8	483.4	19.4	0.37	Korea Rep. of (7.2), Mexico (4.3), India (1.3), Taiwan Province of China (1.1), Brazil (0.8), Turkey (0.4)
%	100	89.4	3.6		

Source: UNSO, COMTRADE data base.

Table 8

Import penetration ratios by developing countries in major developed country markets: Iron and steel (1975-1987)
(in %)

YEAR	Importing countries						
	U S A	Canada	Japan	France a/	Germany Fed.Rep. a/	Italy a/	United Kingdom a/
1975	0.7	0.6	0.3	1.6	0.4	0.9	0.2
1980	1.3	0.9	0.9	1.3	0.9	1.4	0.4
1986	3.2	2.2	1.3	0.8	1.6	1.3	0.5
1987	3.5	2.6	1.9	0.6	1.6	1.7	0.5

Source: UNCTAD secretariat calculations based on OECD compatible trade and production data base for 1975-1986; UNCTAD estimates for 1987.

a/ Import penetration ratios for countries members of EEC are calculated excluding intra-EEC trade.

Table 9

Employment in the steel industry

Country or area	Changes in employment	
	in per cent 1974 - 1988	in thousands 1974 - 1988
Developed countries		
USA	- 59	-309
Canada	- 14	- 11
Japan	- 33	-153
EEC a/	- 55	-485
Belgium	- 56	- 36
France	- 66	-105
Germany, Federal Republic of	- 44	-101
Italy	- 39	- 37
Spain b/	- 55	- 49
United Kingdom	- 72	-139
Developing countries		
Brazil b/	+ 31	+ 37
India b/	+ 47	+ 93
Yugoslavia b/	+ 33	+ 14

Source: Calculated on the basis of statistics of the International Iron and Steel Institute, World Trade in Figures, 1989.

a/ Ten member States.

b/ Estimates.

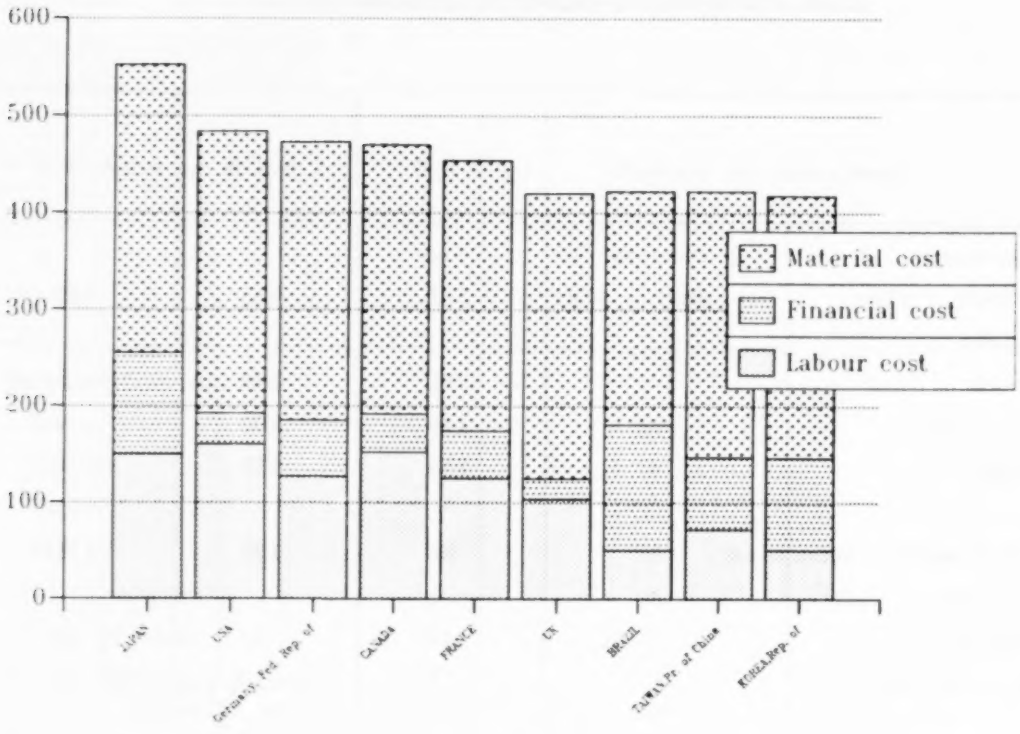
Table 10

Crude steel-making capacity (million tonnes)

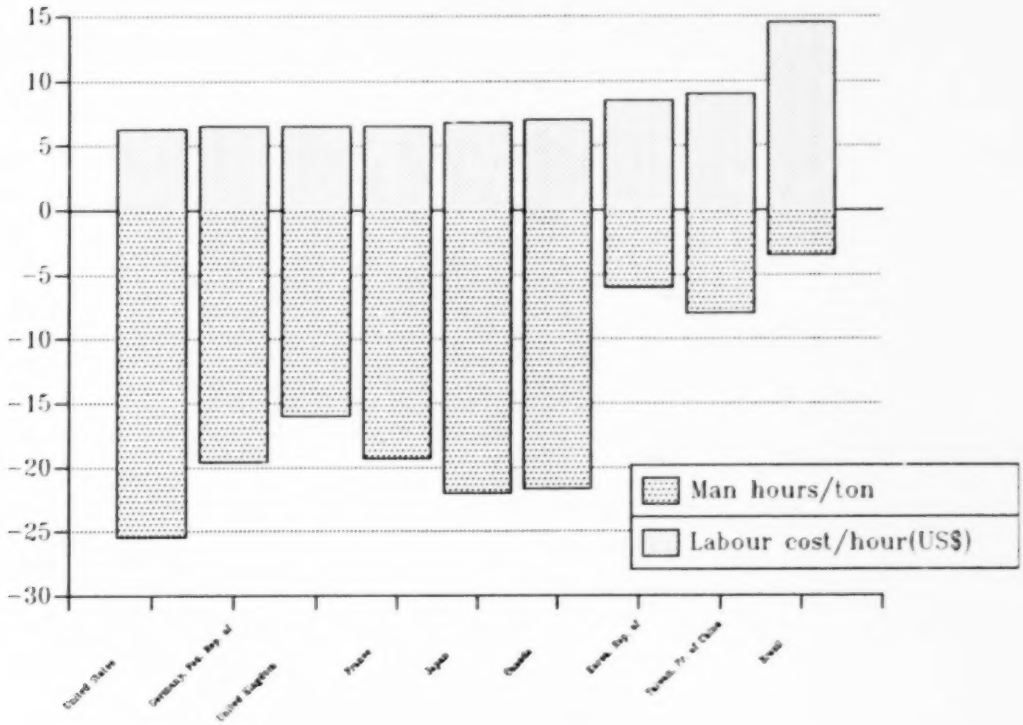
	1980	1988	1995
OECD	577	495	450
of which:			
EC-12	222	189	- -
US	139	102	- -
Japan	159	151	- -
Non-OECD market economies	85	124	151
of which:			
Brazil	17	27	29
South Korea	9	17	23
Non-market economies	280	321	333
of which:			
China	45	67	79
WORLD TOTAL	942	940	934

Source: OECD.

Graph 1a: Cost levels and structure of steel production



Graph 1b: Productivity levels and hourly labour cost of steel production in selected countries



Note: Cost figures relate to estimated pretax cost per metric ton as of November 1988.

Source: Prepared by te UNCTAD Secretariat on the basis of figures in "World Steel Dynamics", Paine Weber, New York 1989.